

Safety Analysis For Evaluating (SAFE) sUAS, Phase II

Completed Technology Project (2017 - 2022)

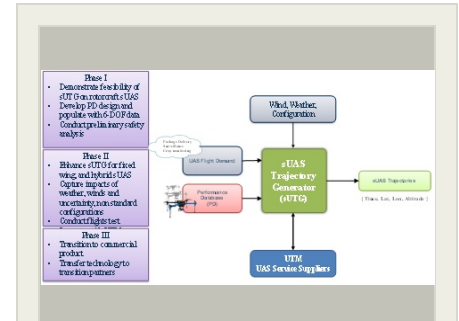


Project Introduction

The primary goal of Air Traffic Management systems is to ensure safety of operations, in the air and on the ground. While they system have served the National Airspace (NAS) well over the years, the imminent introduction of Unmanned Aircraft Systems (UASs) poses a serious challenge. The variety, flexibility and accessibility of UASs ensures high demand for their use. The low-altitude, small-UAS (sUAS) are perhaps the most attractive platforms due to the low cost to own and maintain. These aircraft pose unique safety risks that are very different from other manned and unmanned aircraft. To address these risks Intelligent Automation, Inc. (IAI) along with its subcontractor Purdue University propose to develop higher fidelity sUAS Trajectory Generator (sUTG) tool for Small UASs. The tool is capable of modeling rotorcraft, fixed wing and hybrid sUAS while accounting for the impacts of winds and sensor uncertainty. The model architecture allows for the use of high fidelity 6-DOF data augmented by flight plan data. The lack of credible trajectory model for sUASs is sorely required for improved mission designs, safety analyses, contingency management and NAS performance estimation. This effort is a step in this direction.

Anticipated Benefits

Our proposed technique can be used for a wide range of remote sensing applications for NASA and other parts of US government including: - Integrating with existing UAS specific tools and ecosystem - NASA can use sUTG as a template to develop similar model to augment trajectory based tools - Integrating with legacy modeling and simulation tools such as ACES and FACET - FAA can also use the performance databased being created under this project as a template to standardize performance specifications - FAA researchers can use sUTG to analyze proposed used of sUAS before issuing a Certificate of Authorization (COA) The most promising Non- NASA commercial applications are: - Additional enhancement to autopilot system - Standalone safety analysis tool.



Safety Analysis For Evaluating (SAFE) sUAS, Phase II Briefing Chart Image

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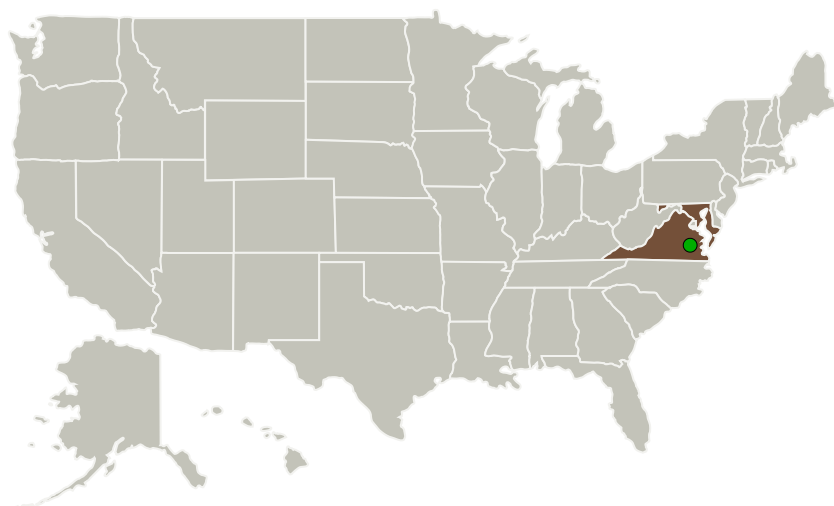
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Intelligent Automation, Inc.	Lead Organization	Industry	Rockville, Maryland
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Maryland	Virginia

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Intelligent Automation, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Managers:

Keith L Woodman
Rania W Ghatas

Principal Investigator:

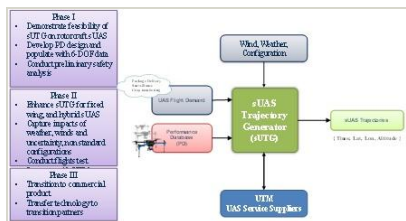
Sricharan Ayyalasomayajula

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Images



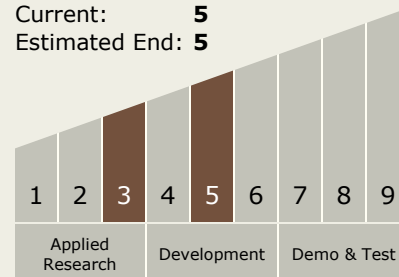
Briefing Chart Image

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(<https://techport.nasa.gov/image/125889>)

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System